



Convention Dates
(Germany)

Sept. 11, 1935:
August 24, 1936:

Corresponding Applications
in United Kingdom

No. 24852/36.1
No. 24853/36.1 Dated Sept. 11, 1936.

(One Complete Specification Left under Section 91 (2) of the Patents and Designs Acts, 1907 to 1932.)

Specification Accepted: March 18, 1937.

COMPLETE SPECIFICATION

Improvements in Wire Stapling Devices

We, C. L. LASCH & Co. (Sole responsible partner PAUL WETZEL), of 10, Lutherstrasse, Leipzig, C.I., Germany, a German Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in wire stapling devices. In wire stapling apparatus for U-shaped staples, it is necessary that when the staple is driven through the material to be stapled, the ends of the limbs be bent over or clenched at the underside of the material. The devices which have hitherto been used for this clenching have the disadvantage that they either necessitate after the driving of the staples through the material a further quite strong lever pressure, or they necessitate the releasing of a stop device which normally holds the work support raised and this releasing, which must be effected after the driving of the staple through the material to be stapled, is effected either by hand or by the limb ends of the staples themselves. The latter device has, however, the disadvantage that it only functions correctly with a definite length of staple limb.

The object of this invention is to overcome these disadvantages and to this end, according to the invention, the releasing of the aforesaid stop to permit clenching is effected by the staple cross-bars. In a suitable arrangement a lock-releasing rod struck by the staple cross-bar is longitudinally movably arranged on the underside of the upper part or of the staple bar of the stapling device. The locking member or stop which is drawn back in the known manner by spring action into the locking position can be so formed and arranged that the support is thereby at the same time raised into the supporting position. A weak spring, which does not considerably increase the bending resistance can also be provided for this purpose. The locking arrangement according to the invention has the advantage that

the tips of the limbs are not subjected to any resistance and, on passing through the material to be stapled, are bent by bending blocks, shaped in the usual manner, in conformity with the final bending position, and that further the support is directly and not indirectly disposed above the bending blocks.

In a modification of the invention, the unlocking rod is actuated not by the cross-bar of the staples but by the striking of a suitable abutment moved together with the staples against a part of the unlocking rod, one of the two parts being provided advantageously with an adjustable abutment, for example an adjusting screw. The unlocking of the movable support for the material can, for example, be effected in that a part of the driver actuating device acts against a bell-crank lever on the unlocking rod which is pivoted to the staple head or its front plate. The adjusting screw can be arranged either on the striking or on the struck part. Compared with the releasing of the stop by the cross-bar of the staple the last described method of operation of the unlocking rod has the advantage that it allows of an accurate regulation of the unlocking and a larger striking stroke for the releasing of the stop. Further, the driver and the staple are relieved of the work of unlocking the support which is fundamentally advantageous because, in spite of a good guiding of the staple in the driver channel, a certain capability of movement of the cross-bar of the staple in the channel is unavoidable and the danger exists of the staple bending under the resistance of the unlocking rod against movement by the pressure of the staple cross-bar on the bevelled surface of the rod.

In order that the invention may be fully understood we will now describe two embodiments thereof by way of example by reference to the accompanying drawing drawings, in which:

Figs. 1 and 2 are each longitudinal sectional views Fig. 1 showing the position of the parts directly before the releasing

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of the improved locking device, and Fig. 2 after the releasing of the locking device,

Fig. 3 is partly a front view and partly a section on the line A—B of Fig. 1, and

Fig. 4 a front view and section on the line C—D of Fig. 2.

Figs. 5 and 6 are similar views to Figs. 1 and 2 respectively, but showing a modified construction, and

Figs. 7 and 8 are a front and sectional view on the line A—B of Fig. 5 and C—D of Fig. 6 respectively.

The stapling table or support 1 is pivoted at the front end by means of bolts 2 to the base plate 3 and rests with the rear end on springs 4 which, in co-operation with a stop 5, determine the horizontal rest position of the table 1. In a slot of the table plate are secured pivotally by one of their ends, bending blocks 6, the free ends of which are supported on a boss 7 of the base plate.

On the underside of the upper part 8 or of the staple guiding bar 9, connected therewith, is a bar 10 longitudinally movably guided in a longitudinal groove which bar is held in the groove by clamps 11. Recesses 12 arranged in the bar 10 allow of a small longitudinal displacement of the bar with respect to the clamps 11. The rear end of the bar 10 is pivotally connected to a lever 19 which at one end is pivoted to the upper part 8 or to the staple arm 9 and at the other end is pivotally connected by a connecting rod 13 with the locking arm or stop 14. The locking arm 14 is pivoted to the base plate 3 and, under the action of a tension spring 15 engaging the rod 13, takes up the position shown in Fig. 1 in which it stands perpendicularly under the free table end and prevents the downward movement of the said table end. The bevelled forward end of the bar 10 forms a striking surface 16 and projects, under the action of the spring 15, into the guiding channel of the driver 17 so that a staple 18, driven by the driver downwardly through the material to be stapled, strikes with its cross-bar against the striking surface and forces back the bar 10. The movement of the bar 10 thus only takes place after the staple limbs have been wholly or for the greater part driven through the material to be stapled and the bending of the staple limbs is about to begin. By the movement of the bar 10 the stop 14 under the table plate 1 is drawn forward through the medium of the bar 13. The table plate 1 is pressed downwardly by the stapling pressure against the resistance of the springs 4 as far as a stop on the boss 7 of the base plate, whereupon the bending blocks 6 take up the position shown in Figs. 2 and 4 in which they press the limb parts of

the staple, which have been already driven through the material to be stapled, securely to the underside of the said material.

The spring 4 need only have quite a small tension as the stapling pressure which is necessary for driving the staple limbs through the work is taken by the locking arm 14. In consequence, only the pressure necessary for this purpose alone need be provided for the bending of the staple limbs. The springs 4 can even be dispensed with and, instead thereof, the locking arm or arms 14 can be provided with a cam edge or cam edges so that on their return movement into the locking position under the action of the tension spring 15 they raise the free end of the table. The bar 10 and the rod 13 can have a suitable length corresponding to the shape of the material to be stapled.

In the modified arrangement shown in Figures 5 to 8, the rod 13, connected at one end to the locking arm 14, is connected at the other end through a two-armed lever 21 pivoted at 20 to the frame 8 of the stapling device with a rod 22. This extends along the said frame. The forward end of the rod 22 is connected to one of the arms 23 of a bell crank lever, the other arm 24 of which lies in front of the front plate 25 and is pivoted by the bolt 26 to the front plate. An adjusting screw 27 acts against the contact arm 24 which screw is screwed into the operating lever 28 of the driver and is advantageously provided with a device, for example, a nut or the like to secure its adjustment.

By suitable adjustment of the screw 27 the actual time of the unlocking of the support 1 can be suitably adjusted, for example, such that the unlocking and the consequent clenching takes place when the cross-bar of the staple contacts with the material.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A wire stapling device for U-shaped staples of the kind in which the limb parts of the staples driven through the material to be stapled, are clenched by blocks pivotally carried by a movable support for the material and adapted to be brought into operation by a counter-pressure member on a movement of the support caused by the stapling pressure, after a locking device or stop, preventing the premature movement of the support and action of the clenching blocks, has been released, characterised in that the locking device of the movable support is re-

leased by the striking of the cross-bar of the staple when the latter has been driven through the material, on the end of a member forming part of a lock-releasing linkage.

2. A wire stapling device as claimed in Claim 1, wherein the member forming part of the lock-releasing linkage, struck by the staple cross-bar, is guided longitudinally movably, preferably in a longitudinal groove, on the underside of the upper part of the stapling device or of the staple guide bar and is bevelled on the forward end to form a striking surface.

3. A wire stapling device as claimed in Claim 1 or 2, wherein the locking device is provided with a cam surface and automatically raises the movable support on returning into the locking position under the action of a spring.

4. A modification of the wire stapling device as claimed in Claim 1, wherein the

locking device of the movable support, for the material is released by the striking of a suitable member moved together with the staple against a part of the lock-releasing linkage.

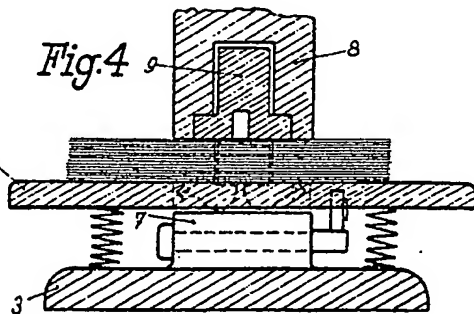
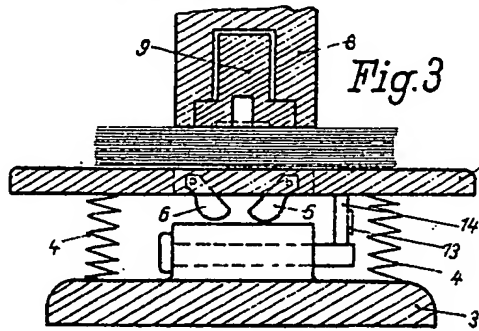
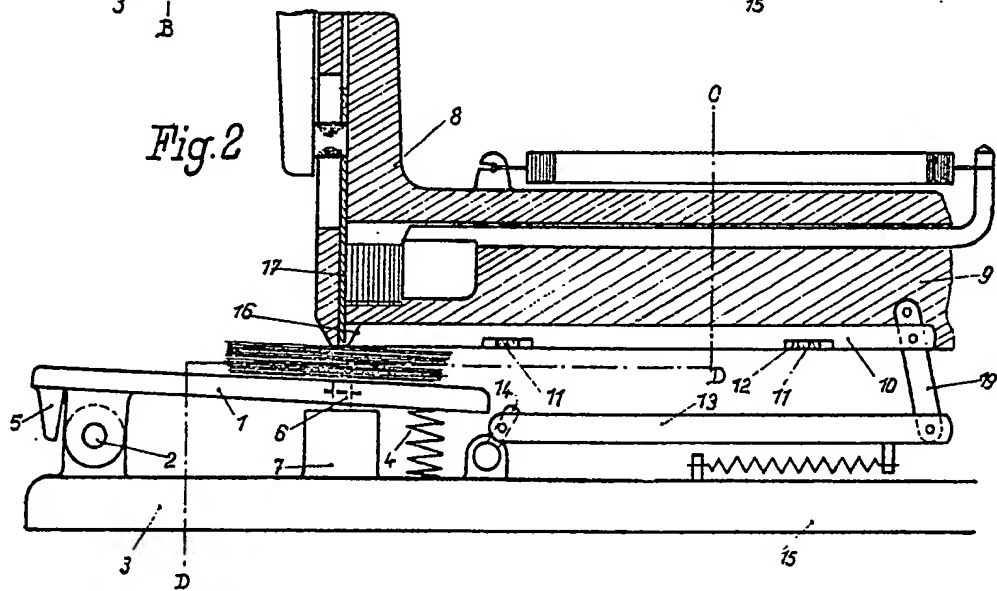
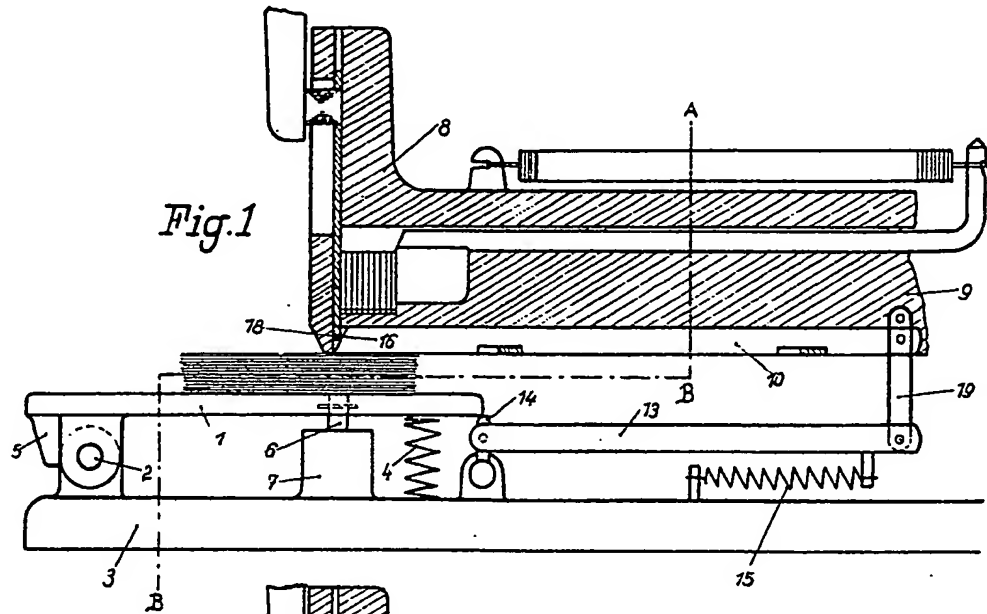
5. A wire stapling device as claimed in Claim 4, wherein the said member acts against a bell crank lever of the unlocking linkage which lever is pivoted to the upper part of the device or the front plate thereof and an adjustable striking member in the form of an adjusting screw arranged on the member or on the bell crank lever.

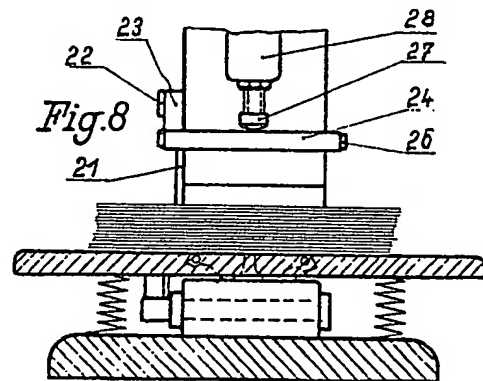
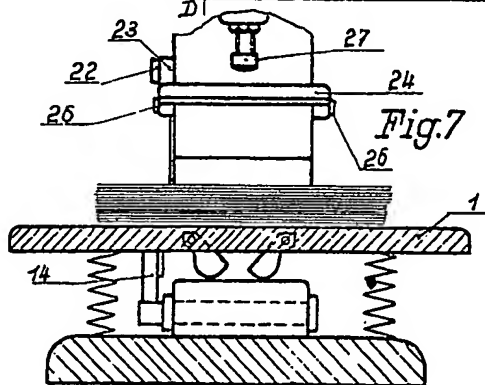
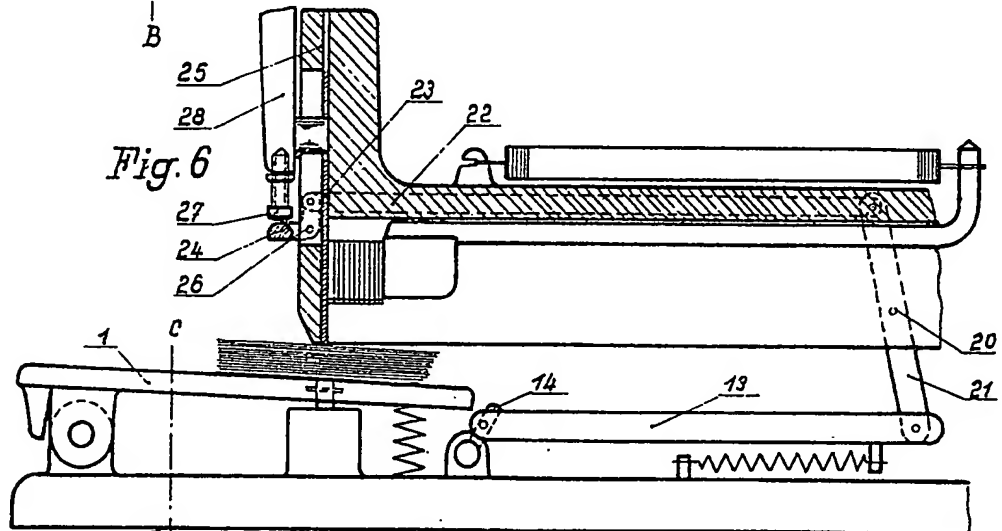
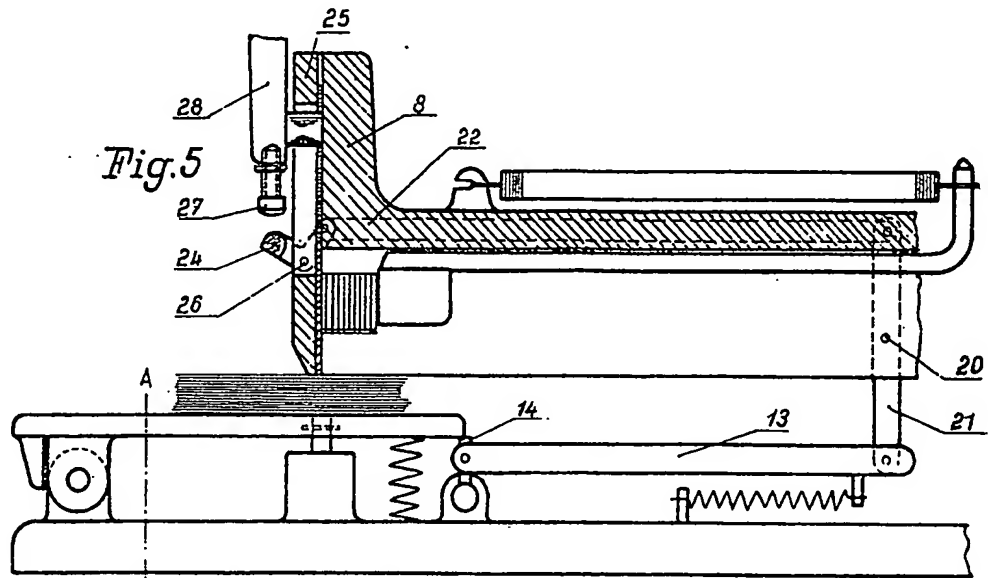
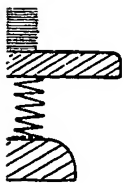
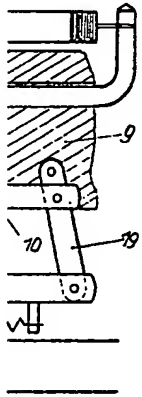
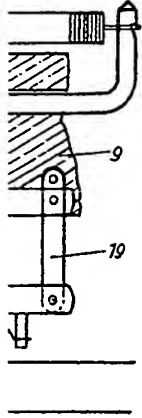
6. The improved wire stapling device, constructed and arranged substantially as hereinbefore described and illustrated in the accompanying drawings.

Dated the 8th day of September, 1936.

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